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CONTENTS

S. No.	TITLE	Page No.
DRDO News		1-4
DRDO Technology News		1-4
1.	Engineering student's life-saving invention bags DRDO's innovation contest award	1
2.	U.S. Air Force Research Lab collaborates with India for rare nanomaterials	2
3.	NIT-R pins hope on space proposals to ISRO	4
Defence News		5-13
Defence Strategic: National/International		5-13
4.	Raksha Mantri Shri Rajnath Singh to address SCO webinar on Role of Women in Armed Forces	5
5.	रक्षा मंत्री श्री राजनाथ सिंह सशस्त्र बलों में महिलाओं की भूमिका पर एससीओ वेबिनार को संबोधित करेंगे	6
6.	Dilli Series Sea Power Webinar – 2021	7
7.	Army Chief Naravane meets Sri Lankan PM Rajapaksa to boost defence ties	8
8.	Indian Army Chief General, Sri Lankan counterpart discuss defence ties	9
9.	श्रीलंका दौरे पर सेना प्रमुख: सैन्य-असैन्य सहयोग पर चर्चा के लिए श्रीलंका के राष्ट्रपति और प्रधानमंत्री से मिले सैन्य प्रमुख नरवणे	10
10.	Three more Rafale jets to arrive from France, to land in Gujarat's Jamnagar	11
11.	US Chief of Naval Operations arrives in Visakhapatnam on 3-day tour	12
12.	India, France hold dialogue on maritime cooperation to bolster strategic ties	13
Science & Technology News		14-18
13.	How to force photons to never bounce back	14
15.	Study demonstrates the potential of a quantum computer comprised of a small processor and a storage unit	15
16.	A highly simplified way to predict quantum light-matter interactions	16
COVID-19 Research News		18-18
17.	More than half of covid-19 patients suffer from long haul symptoms, study finds	18

THE TIMES OF INDIA

Thu, 14 Oct 2021

Engineering student's life-saving invention bags DRDO's innovation contest award

Coimbatore: A student of Bannari Amman Institute of Technology (BIT), who won the third prize in the Defence Research and Development Organisation's (DRDO) innovation contest 'Dare to Dream 2.0' for formulating a flame-retardant bio-based epoxy resin composite that can minimise casualty during aircraft accidents, received a prize money of Rs 3 lakh from Union defence minister Rajnath Singh at an event held in New Delhi on October 4.

DRDO had launched innovation contest on the 5th death anniversary of former President APJ Abdul Kalam last year.

N Pravin, a IIIrd-year BTech Biotechnology student, who was enrolled in bioprocess and bioproducts special laboratory, submitted his proposal under the problem domain of Materials and Technologies for Fire Suppression Protection. Of the 65,000 individual participants, he cleared three rounds to receive the third prize.

As many as 284 deaths were reported due to aircraft accidents in India in 2019, Pravin said. "After analysing the reasons for fire accidents and aircraft accidents, it was found that enhancing fire retardant of composite can reduce the severity of accidents," he said.

Commercially available composites contain petroleum-based products that catch fire when exposed to high temperature. He used nanoparticles obtained from natural resources as a flame-retardant.

It was also approved by jury members of the DRDO contest for proposal submission under technology development funding (TDF) scheme for a funding of up to Rs 10 crore.

Pravin was guided by R Ravi kumar, M Kirupa Sankar and A Vimalarasan, faculty in-charges of the bioprocess and bioproducts special lab. "For flame-retardant property, he used nanoparticles obtained from natural resources and incorporated those flame-retardant nanoparticles onto natural fibre composite, thus making the whole product biocompatible and biodegradable. Since this is a novel idea, it is eligible for patent also," said Ravi.

<https://timesofindia.indiatimes.com/city/coimbatore/engineering-students-life-saving-invention-bags-drdos-innovation-contest-award/articleshow/87004510.cms>

U.S. Air Force Research Lab collaborates with India for rare nanomaterials

The U.S. Air Force Research Laboratory said it is working to increase availability of rare nanomaterials and strengthen U.S. scientific and manufacturing ties with India.

Nanomaterials are thin – about 1/100,000th of the thickness of a human hair.

AFRL and its partners are harnessing nanomaterials' unique optical, magnetic, electrical, and other properties for improved optoelectronics, quantum devices, high-temperature coatings, thermal management, and more.

But a lack of scalable nano manufacturing has impeded progress, according to

“Exploration of Nano Manufacturing Scale up Opportunities with India,” a white paper written by Dr. Ajit K. Roy, Principal Materials Research Engineer and Computational Group Leader in AFRL’s Materials and Manufacturing Directorate.

The white paper was a collaborative effort with representatives from Rice University, India’s Defense Research and Development Organization (DRDO), and the Indian Institute of Technology Kanpur (IITK).

Roy guided the India-nano strategy development effort with the help of co-leads Dr. Nick Glavin and Dr. Michael McConney. Glavin focused on ties to academia in India, and McConney cultivated links to industry.

AFRL Chief Technologist Dr. Tim Bunning was part of a meeting at Rice University on July 29 in which the white paper partners organized for a year-long study of how to leverage India’s scientific and manufacturing expertise to increase the availability of nanomaterials.

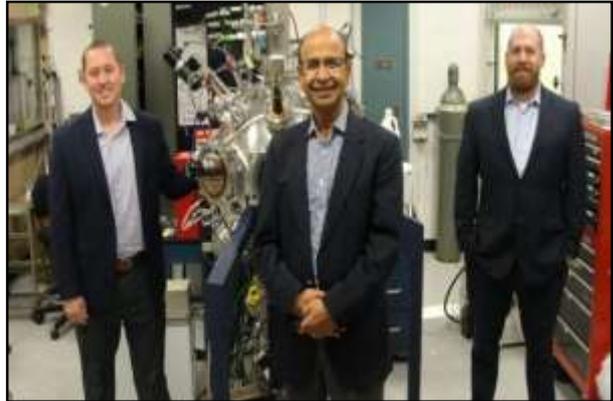
The white paper identified four nano manufacturing challenge topics:

- Overcoming the non-uniformity in nano-scale structure-property
- Process modeling, low-cost processing and scalability issues
- Identifying conditions for 2D materials growth below 400 degrees Celsius -- compatible with the semiconductor industry
- Nanostructure defect and morphology control

AFRL’s 711th Human Performance Wing and the lab’s Sensors, Munitions, and Materials and Manufacturing directorates are contributing expertise to the challenge topics.

After the year of study, the international team will present recommendations in two papers addressing the policy aspect of industrial cooperation, and the tech sprints associated with technical challenges in nano manufacturing.

“The effort will be considered to be a success if the U.S. is able to develop projects with India in advancing scalable and low-cost nano manufacturing technology via leveraging skill and resources between the two countries,” Roy said.



From left, Dr. Nick Glavin, Dr. Ajit Roy, and Dr. Michael McConney stand with a nanomaterial Deposition Chamber at the AFRL's Materials and Manufacturing Directorate.

In September, the Air Force Life Cycle Management Center and the Indian Air Force signed a landmark \$22 million agreement to co-develop air-launched Unmanned Aerial Vehicles (UAV). It was the first co-development project under the DTTI.

Roy said the new nano manufacturing initiative has its roots in a successful ongoing project with India DRDO-Jodhpur lab to develop printable flexible electronics (PFLEX). That effort began in June 2018, and involved \$10.6 million split evenly between the two countries.

He said there is an increased emphasis -- especially from the U.S. side of the Joint Technical Group (JTG) -- on India collaboration to include India academics in future Project Agreements (PAs). The JTG oversees S&T collaboration and approves joint projects between the U.S. and India. The group has been in place for several years and meets annually in coordination with all defense services between the two countries.

“India’s top-tier universities offer vast potential for tapping talent and expertise as compared to that of DRDO labs,” he said. “DRDO management is cooperative with this approach and India academics are to be considered in scoping future PAs, which will be a positive direction for potential quid pro quo resource leveraging.”

In 2019, Roy presented an India science and technology engagement plan to the then director of AFRL’s Materials and Manufacturing Directorate, Tim Sakulich (AFRL India Lead) and then Materials and Manufacturing Directorate Chief Scientist Dr. Tim Bunning. Sakulich is now Executive Director of AFRL and Bunning is AFRL Chief Technology Officer.

Roy said the emphasis of his plan was to use PAs to increase participation of India academics through DRDO, which could fund Indian universities with bigger joint projects.

“In the current framework, the projects under the Air Force Asian Office of Aerospace Research and Development (AOARD), and Indo-U.S. S&T Forum funding are resource-limited and small,” Roy said. “But if DRDO and India academics are pulled together, the potential could be huge and long term in India collaboration.”

Sakulich’s comment was, “Not “if” – make it happen”, said Roy.

Brian McJilton, director of the Air Force Research Laboratory Small Business Directorate, said he learned of the university/international/AFRL collaboration as a potential Science & Technology 2030 Strategy partner-funded initiative last year.

https://www.defenseworld.net/news/30576/U_S_Air_Force_Research_Lab_Collaborates_With_India_for_Rare_Nanomaterials#.YWauVh9czcc

NIT-R pins hope on space proposals to ISRO

Earlier on March 25, ISRO and NIT-R had signed an MoU to support young academia engage in innovation and research in space technology

Rourkela: Amid fresh impetus on participation of private entities in space sector, ISRO's eastern zone Space - Technology Incubation Centre (S-TIC) at the National Institute of Technology - Rourkela (NIT-R) is all set to play significant role in exploring untapped opportunities.

Earlier on March 25, ISRO and NIT-R had signed an MoU to support young academia engage in innovation and research in space technology.

Besides, the aim was to motivate them to initiate business starts-up in space technology and applications. ISRO gave a detailed list of required products and applications with the objective of using successful projects in future space missions.

NIT-R registrar Prof PK Das said in the first phase, a total of 37 product development project proposals have been submitted to ISRO from the eastern zone.

"Majority proposals were from NIT-R. The proposals are being scrutinised and if approved, new starts-up are likely to come up," Das informed.

Sources said a clear picture on the number of proposals approved by ISRO will emerge by end of October.

Former director of NIT-R Prof SK Sarangi said the Central government is putting fresh impetus on private participation in non-military space technology and applications.

India is an emerging global power in space technology and applications and the vast sector is being opened to private entities known for innovation and competitiveness, he added.

The high demand for micro and mini satellites needs domestic mass production. Opportunities are unlimited for new generation technical entrepreneurs and NIT-R has the edge with high quality manpower.

Many skilled young minds from the institute would venture into start-ups for production of new small satellites, components and subsystems to create both wealth and employment, Sarangi added.

The S-TIC at Rourkela is the nodal centre in eastern zone comprising Odisha, West Bengal, Bihar, Jharkhand and the Union Territory of Andaman and Nicobar Islands.

Meanwhile, NIT-R is also in talks with the Defence Research Development Organisation (DRDO) to set up an incubation centre at the institute to help find out solutions for defence-related problems.

<https://www.newindianexpress.com/states/odisha/2021/oct/13/nit-r-pins-hope-on-space-proposals-to-isro-2371109.html>

Defence Strategic: National/International



Press Information Bureau

Government of India

Ministry of Defence

Wed, 13 Oct 2021 4:16PM

Raksha Mantri Shri Rajnath Singh to address SCO webinar on Role of Women in Armed Forces

Key highlights:

- *CDS General Bipin Rawat will deliver welcome address*
- *Session on 'Historical Perspective of Women's Roles in Combat Operations' will be chaired by Dy Chief of IDS (Medical) Lt General Madhuri Kanitkar*
- *Former Foreign Secretary Mrs Nirupama Rao Menon will chair session on 'Emerging Trends in Wars and Likely Roles of Women Warriors'*

Raksha Mantri Shri Rajnath Singh will deliver the inaugural address at a webinar on 'Role of Women in Armed Forces', being organised by Shanghai Cooperation Organisation (SCO) on October 14, 2021. The international webinar in video conference mode is hosted by the Ministry of Defence.

Chief of Defence Staff General Bipin Rawat will deliver the welcome address. The representatives of the SCO member countries will share their experiences which will enrich and inform policy makers and practitioners alike.

The webinar will be conducted in two sessions. The first session on 'Historical Perspective of Women's Roles in Combat Operations' will be chaired by Deputy Chief of Integrated Defence Staff (Medical) Lt General Madhuri Kanitkar. Apart from India, speakers from China, Kazakhstan and Kyrgyzstan will share their perspectives in the session.

The Second session will be chaired by Former Foreign Secretary Smt Nirupama Rao Menon. Theme of the session is: 'Emerging Trends in Wars and Likely Roles of Women Warriors'. Representatives from Pakistan, Russian Federation, Tajikistan and Uzbekistan will share their views on the subject.

The conference was originally planned with the physical presence of the representatives of the member states in the year 2020, however, owing to COVID-19 pandemic, is now being conducted via video conferencing, as despite the pandemic the interaction between the SCO member states remain important.

Closing address will be delivered by the Chief of Integrated Defence Staff to the Chairman, Chiefs of Staff Committee (CISC) Air Marshal BR Krishna. Senior civil and military officials of MoD will also be present in the webinar.

The Government of India has recognized women as proud and essential members of the Indian Defence forces and the potential they bring to the Armed Forces. Accordingly, in the last seven years, the Government has taken several steps to bring in more opportunities for women in the Indian Defence forces as well as create equality in service conditions for women and men. Today, women are greatly empowered within the Indian Defence Forces, whether it is the Indian Army, Indian Navy or the Indian Air Force.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1763612>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Wed, 13 Oct 2021 4:16PM

रक्षा मंत्री श्री राजनाथ सिंह सशस्त्र बलों में महिलाओं की भूमिका पर एससीओ वेबिनार को संबोधित करेंगे

प्रमुख बातें:

- सीडीएस जनरल बिपिन रावत स्वागत भाषण देंगे
- 'कॉम्बैट ऑपरेशंस में महिलाओं की भूमिकाओं के ऐतिहासिक परिप्रेक्ष्य' पर आयोजित सत्र आईडीएस (मेडिकल) की डिप्टी चीफ लेफ्टिनेंट जनरल माधुरी कानिटकर की अध्यक्षता में होगा।
- पूर्व विदेश सचिव श्रीमती निरुपमा राव मेनन 'युद्धों में उभरते रुझानों और महिला योद्धाओं की संभावित भूमिकाओं' पर आयोजित सत्र की अध्यक्षता करेंगी।

रक्षा मंत्री श्री राजनाथ सिंह दिनांक 14 अक्टूबर, 2021 को शंघाई सहयोग संगठन (एससीओ) द्वारा आयोजित 'सशस्त्र बलों में महिलाओं की भूमिका' पर एक वेबिनार में उद्घाटन भाषण देंगे। अंतर्राष्ट्रीय वेबिनार की मेजबानी रक्षा मंत्रालय द्वारा वीडियो कॉन्फ्रेंस मोड में की जाती है।

चीफ ऑफ डिफेंस स्टाफ जनरल बिपिन रावत स्वागत भाषण देंगे। एससीओ सदस्य देशों के प्रतिनिधि अपने अनुभव साझा करेंगे जो नीति निर्माताओं और चिकित्सकों की जानकारी को समान रूप से समृद्ध करेंगे और उन्हें सूचित करेंगे।

वेबिनार दो सत्रों में आयोजित किया जाएगा। 'कॉम्बैट ऑपरेशंस में महिलाओं की भूमिकाओं के ऐतिहासिक परिप्रेक्ष्य' पर पहले सत्र की अध्यक्षता डिप्टी चीफ ऑफ इंटीग्रेटेड डिफेंस स्टाफ (मेडिकल) लेफ्टिनेंट जनरल माधुरी कानिटकर करेंगी। भारत के अलावा, चीन, कजाकिस्तान और किर्गिस्तान के वक्ता सत्र में अपने दृष्टिकोण को साझा करेंगे।

दूसरे सत्र की अध्यक्षता पूर्व विदेश सचिव श्रीमती निरुपमा राव मेनन करेंगी। सत्र का विषय है: 'युद्धों में उभरते रुझान और महिला योद्धाओं की संभावित भूमिकाएं'। पाकिस्तान, रूसी संघ, ताजिकिस्तान और उजबेकिस्तान के प्रतिनिधि इस विषय पर अपने विचार साझा करेंगे।

सम्मेलन की योजना मूल रूप से वर्ष 2020 में सदस्य राज्यों के प्रतिनिधियों की सशरीर उपस्थिति के साथ बनाई गई थी, हालांकि, कोविड-19 महामारी के कारण अब इसको वीडियो कॉन्फ्रेंसिंग के माध्यम से आयोजित किया जा रहा है, क्योंकि महामारी के बावजूद एससीओ सदस्य देशों के बीच बातचीत महत्वपूर्ण बनी हुई है।

समापन भाषण चीफ ऑफ इंटीग्रेटेड डिफेंस स्टाफ द्वारा अध्यक्ष, चीफ ऑफ स्टाफ कमेटी (सीआईएससी) एयर मार्शल बीआर कृष्णा को दिया जाएगा। वेबिनार में रक्षा मंत्रालय के वरिष्ठ नागरिक और सैन्य अधिकारी भी मौजूद रहेंगे।

भारत सरकार ने महिलाओं को, सशस्त्र बलों में वह जो क्षमता लाती हैं, को देखते हुए भारतीय रक्षा बलों के गर्वित और आवश्यक सदस्यों के रूप में मान्यता दी है। तदनुसार पिछले सात वर्षों में, सरकार ने भारतीय रक्षा बलों में महिलाओं के लिए अधिक अवसर लाने के साथ-साथ महिलाओं और पुरुषों के लिए

सेवा शर्तों में समानता पैदा करने के लिए अनेक कदम उठाए हैं। आज भारतीय रक्षा बलों के भीतर महिलाएं, चाहे वह भारतीय सेना हो, भारतीय नौसेना हो या भारतीय वायु सेना हो, बहुत सशक्त हैं।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1763740>



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Government of India

Ministry of Defence

Wed, 13 Oct 2021 6:14PM

Dilli Series Sea Power Webinar – 2021

The 8th Edition of annual 'Dilli Series' Sea Power Seminar, was conducted online in Webinar format on 11 and 12 Oct 21 and streamed live on the Indian Navy official YouTube and Facebook channels. The theme of this year's Webinar was 'Maritime History of the Indian Ocean Region'. Admiral Arun Prakash, PVSM, AVSM, VrC, VSM (Retd), the former Chief of the Naval Staff was the Chief Guest for the event. Dr Shashi Tharoor, Hon'ble Member of Lok Sabha delivered an invitational talk. The two-day Seminar progressed under three sub-themes. The first sub-theme dealt with 'Early Maritime Interactions and Relevance Today' and was moderated by Vice Admiral Pradeep Chauhan, AVSM & Bar, VSM (Retd). The second sub-theme explored 'India's Maritime Journey from 15th to 19th Century and Key Takeaways in the 21st Century' and was moderated by Vice Admiral MS Pawar, PVSM, AVSM, VSM (Retd), the former Deputy Chief of the Naval Staff. The third sub-theme focussed on the, 'Lessons Learnt from India's Maritime Journey - British Raj to Independence and Beyond' and was moderated by Rear Admiral SY Shrikhande, AVSM (Retd).

Commemorating 'Azadi Ka Amrit Mahotsav' - 75 Years of India's independence, the Webinar befittingly culminated with a stimulating Panel Discussion on 'Indian Navy through the Decades (75 Years)' and was moderated by Cmde SB Kesnur, VSM.

The Webinar saw active participation from eminent speakers from both uniformed and civil academia across the Country and abroad, in addition to the participation by the Maritime History Society, Mumbai and the Navy History Division, New Delhi.



<https://pib.gov.in/PressReleasePage.aspx?PRID=1763670>

Army Chief Naravane meets Sri Lankan PM Rajapaksa to boost defence ties

Indian Army Chief General MM Naravane met with Sri Lankan Prime Minister Mahinda Rajapaksa on Wednesday to strengthen bilateral defence ties

By Manjeet Negi

New Delhi: The Chief of the Army Staff (COAS) of the Indian Army, General MM Naravane, called on Sri Lankan Prime Minister Mahinda Rajapaksa. During the meeting, the PM expressed his appreciation for the assistance provided by the Indian Armed Forces to Sri Lanka throughout the years.

The two delegations also discussed regional concerns over growing fundamentalism and terrorism, boosting defence ties and the importance of caring for veterans after their service to the country.

Before meeting the Sri Lankan PM, the COAS called on President Gotabaya Rajapaksa and discussed mutual and strategic cooperation issues.

Earlier, he laid a wreath at the Indian Peace Keeping Force (IPKF) War Memorial in Colombo, paying tribute to the soldiers of the Indian Army who laid down their lives during the Peace Keeping Operations in Sri Lanka's civil war.

On Thursday, the Indian Army Chief will witness the final demonstration of the ongoing bilateral Exercise 'Mitra Shakti' at Maduru Oya Special Forces Training School in the eastern part of the country.

General Naravane arrived in Sri Lanka on Tuesday on a four-day visit at the invitation of his Sri Lankan counterpart, General Shavendra Silva.

During the meeting, the two sides discussed steps to further enhance the excellent defence cooperation between the two neighbouring countries.

Naravane's visit comes a week after Foreign Secretary Harsh Vardhan Shringla visited Sri Lanka and met the country's top leadership and underscored the importance India attaches to expeditiously taking forward mutually beneficial projects.

Commenting on the Indian Army chief's visit, the Indian High Commission earlier said, "during the visit, areas of mutual interest and avenues for enhancing existing bilateral defence cooperation will be discussed, with Sri Lanka being 'Priority One' partner of India".

<https://www.indiatoday.in/india/story/army-chief-naravane-meets-sri-lankan-pm-rajapaksa-to-boost-defence-ties-1864511-2021-10-13>



Indian army chief Gen. Manoj Mukund Naravane inspects a guard of honour at the Sri Lankan military head quarters in Colombo (Photo: PTI)

Indian Army Chief General, Sri Lankan counterpart discuss defence ties

Indian Army chief General Manoj Mukund Naravane met top Sri Lankan military leadership to talk about boosting bilateral defence cooperation between two countries

Colombo: Indian Army Chief General Manoj Mukund Naravane met Sri Lanka's top military leadership today and discussed steps for further enhancing the excellent bilateral defence cooperation.

General Naravane, who arrived on Tuesday on a four-day visit at the invitation of his Sri Lankan counterpart General Shavendra Silva, called on Secretary of the Ministry of Defence, General GDH Kamal Gunaratne (Retd.), and discussed steps to take forward the excellent defence cooperation between Sri Lanka and India, the Indian Army said in a tweet.

He also visited the Army Headquarters where he carried out Turnout Inspection and received a Guard of Honour. "COAS complimented the Guard for impeccable 'Turnout & Parade'," it said in another tweet.

Gen. Naravane called on Gen. Silva and discussed issues related to boosting bilateral defence cooperation between two countries. He also interacted with the senior officers of the Sri Lankan Army during the visit, the Indian Army said.

Gen. Naravane laid a wreath at Indian Peace Keeping Force (IPKP) War Memorial and paid tributes to the bravehearts of the Indian Army who laid down their lives during the Peace Keeping Operations in Sri Lanka. He also interacted with the veterans of the Sri Lankan Army.

He had served in the IPKP in Sri Lanka's north and east from 1987-1990.

"(His) Visit will pave (the) way for deeper cooperation in defence between India and Sri Lanka," the Indian High Commission here said in a tweet on Tuesday.

During his visit, Gen Naravane is expected to call on President Gotabaya Rajapaksa, who is the Commander-in-Chief of the Sri Lankan Armed Forces, and Prime Minister Mahinda Rajapaksa.

On Thursday, he will witness the final demonstration of the ongoing bilateral Exercise 'Mitra Shakti' at Maduru Oya Special Forces Training School in the east.

India and Sri Lanka last week began a 12-day mega military exercise with a focus on enhancing counter-terror cooperation at the Combat Training School in the island nation's eastern district of Ampara.

The eighth edition of the 'Mitra Shakti' exercise from October 4 to 15 got underway with the participation of an all arms contingent of 120 Indian Army personnel, headed by Colonel Prakash Kumar. The joint military exercise has been designed to enhance understanding of transnational terrorism, inter-operability skills, conduct of joint tactical operations, sharing of each other's best practices and experiences, the Sri Lanka Army said.

The annual training programme, which has largely contributed to strengthen bilateral military cooperation, understanding and bonds of neighbourly relations between both services, takes place alternately either in India or Sri Lanka every year, it added.

Gen. Naravane's visit is taking place a week after Foreign Secretary Harsh Vardhan Shringla visited Sri Lanka and met the country's top leadership and underscored the importance India attaches to expeditiously taking forward mutually beneficial projects. Mr Shringla had also thanked President Rajapaksa for his guidance and close cooperation in the defence and security sphere.

(Except for the headline, this story has not been edited by NDTV staff and is published from a syndicated feed.)

<https://www.ndtv.com/india-news/indian-army-chief-general-manoj-mukund-naravane-sri-lankan-counterpart-shavendra-silva-discuss-defence-ties-2574253>

श्रीलंका दौरे पर सेना प्रमुख: सैन्य-असैन्य सहयोग पर चर्चा के लिए श्रीलंका के राष्ट्रपति और प्रधानमंत्री से मिले सैन्य प्रमुख नरवणे

सार

जनरल नरवणे ने सुबह प्रधानमंत्री महिंदा राजपक्षे से भी उनके आधिकारिक आवास 'टेंपल ट्रीज' पर मुलाकात की। श्रीलंका के न्यूज चैनल के अनुसार जनरल नरवणे ने प्रधानमंत्री महिंदा राजपक्षे से कहा, दोनों सशस्त्र बलों के बीच उत्कृष्ट संबंध हैं।

विस्तार

भारतीय थल सेना प्रमुख जनरल मनोज मुकुंद नरवणे ने बुधवार को यहां श्रीलंका के राष्ट्रपति गोटाबाया राजपक्षे व प्रधानमंत्री महिंदा राजपक्षे से मुलाकात की तथा दोनों देशों के बीच प्रगाढ़ द्विपक्षीय रक्षा सहयोग समेत को आगे बढ़ाने के उपायों पर चर्चा की। भारतीय उच्चायोग ने ट्वीट किया कि भारतीय थल सेना के प्रमुख जनरल एम एम नरवणे ने राष्ट्रपति गोटाबाया राजपक्षे से मुलाकात की, ताकि द्विपक्षीय रक्षा सहयोग को और मजबूत बनाने के लिए उनका मार्गदर्शन हासिल किया जा सके।



एम एम नरवणे, सेना प्रमुख - फोटो : ANI

जनरल नरवणे ने सुबह प्रधानमंत्री महिंदा राजपक्षे से भी उनके आधिकारिक आवास 'टेंपल ट्रीज' पर मुलाकात की। श्रीलंका के न्यूज चैनल के अनुसार जनरल नरवणे ने प्रधानमंत्री महिंदा राजपक्षे से कहा, दोनों सशस्त्र बलों के बीच उत्कृष्ट संबंध हैं। उन्होंने कहा कि यह सकारात्मक बातचीत दोनों देशों के बीच सभी स्तरों पर द्विपक्षीय संबंधों को मजबूत बनाने में मदद करेगी।

चैनल ने बताया कि प्रधानमंत्री महिंदा राजपक्षे ने भारतीय सशस्त्र बलों द्वारा पूरे वर्ष श्रीलंका को दी गई सहायता, खासकर प्रशिक्षण के क्षेत्र में, की सराहना की। जनरल नरवणे ने श्रीलंका के विदेश सचिव जयंत कोलंबगे से भी मुलाकात की। इससे पहले जनरल नरवणे ने रक्षा मंत्रालय के सचिव जनरल (सेवानिवृत्त) जीडीएच कमल गुनारत्ने से मुलाकात की तथा श्रीलंका व भारत के बीच प्रगाढ़ रक्षा सहयोग को और आगे बढ़ाने के उपायों पर चर्चा की।

उन्होंने सेना मुख्यालय का भी दौरा किया और सम्मान गारद का निरीक्षण किया। भारतीय सेना ने कहा कि जनरल नरवणे ने जनरल शार्वेद्र सिल्वा से मुलाकात की और दोनों देशों के बीच द्विपक्षीय रक्षा सहयोग को बढ़ावा देने से संबंधित मुद्दों पर चर्चा की। उन्होंने यात्रा के दौरान श्रीलंकाई सेना के वरिष्ठ अधिकारियों से भी बातचीत की।

<https://www.amarujala.com/india-news/indian-army-chief-gen-naravane-meets-sri-lanka-top-military-leadership-discusses-steps-to-boost-defence-ties-latest-news-update>

Three more Rafale jets to arrive from France, to land in Gujarat's Jamnagar

In a capability boost for the Indian Air Force (IAF), three more Rafale aircraft are expected to arrive from France later today

By Manjeet Negi

New Delhi: In a further boost to its fleet of fighter aircraft, the Indian Air Force is set to get three more Rafale fighter jets on Wednesday. They are going to land shortly in Gujarat's Jamnagar after flying for over six hours from a French airbase earlier today.

The three new aircraft coming from France would take the Indian Rafale fleet to 29, giving India more options to deploy a significant number of these highly capable planes on both the northern borders and eastern frontier.

The first batch of five Rafale jets arrived in India on July 29, 2020.

The Rafale fighters are capable of defeating enemy air defence mechanisms and strike targets in the Tibet Autonomous Region. The Indian Air Force had formally inducted Rafale aircraft into No. 101 Squadron at Air Force Station Hasimara in Eastern Air Command (EAC) on July 28 this year. 101st is the second IAF Squadron to be equipped with Rafale aircraft



Indian Air Force fighter jet Rafale during the full dress rehearsal for the 89th Air Force Day parade. (PTI Photo)

India and France had signed an inter-governmental agreement in 2016 to procure 36 Rafale jets at a cost Rs 59,000 crore.

The twin-engine Rafale jets are capable of carrying out a variety of missions, such as ground and sea attack, air defence and air superiority, reconnaissance, and nuclear strike deterrence.

The last batch of Rafale aircraft will land next year, which are to be the most capable of the entire lot.

India is now going to place orders for 114 multi-role fighter aircraft along with the indigenously developed stealth fighters Advanced Medium Combat Aircraft whose seven squadrons would join the Air Force in the next 15-20 years.

<https://www.indiatoday.in/india/story/iaf-rafale-fighter-aircraft-defence-china-border-france-1864439-2021-10-13>

US Chief of Naval Operations arrives in Visakhapatnam on 3-day tour

Admiral Michael Gilday was given a guided tour of facilities at Visakhapatnam Naval Dockyard

By Sreenivas Janyala

Hyderabad: Admiral Michael Gilday, Chief of Naval Operations (CNO), US Navy, arrived in Visakhapatnam Wednesday on a three-day official visit. Admiral Gilday interacted with Vice Admiral Ajendra Bahadur Singh, Flag Officer Commanding-in-Chief, Eastern Naval Command, where various issues of common interest to both navies were discussed.

Later, Admiral Michael Gilday was given a guided tour of facilities at Visakhapatnam Naval Dockyard. The CNO paid homage to naval personnel who have made the supreme sacrifice in the line of duty to the nation at the 'Smaram Sthal' Memorial in Naval Dockyard.

The Admiral is scheduled to embark the USN Carrier Strike Group participating in Exercise Malabar, along with Chief of Naval Staff Admiral Karambir Singh, Vice Adm Ajendra Bahadur Singh, and other US-India delegates on Thursday. Linda Gilday will interact with the Committee Members and ladies of the Navy Wives Welfare Association (NWWA) (Eastern Region) and will also visit the NWWA facilities during her stay at Visakhapatnam.

The Indian Navy is currently participating in the Second Phase of Multilateral Maritime Exercise Malabar along with the Japan Maritime Self Defence Force (JMSDF), Royal Australian Navy (RAN) and the United States Navy (USN). The exercise is being conducted in the Bay of Bengal, with INS Ranvijay and INS Satpura participating.

The exercise has the participation of nine ships including US Aircraft carrier USS Carl Vinson, Japanese Helicopter Carrier JS Kaga, USS Lake Champlain, USS Stockdale, HMAS Sirius, HMAS Ballarat, and JS Murasame. This second phase of the exercise is focusing on advanced surface and anti-submarine warfare exercises, seamanship evolution and weapon firings.

<https://indianexpress.com/article/cities/hyderabad/us-chief-of-naval-operations-arrives-in-visakhapatnam-on-3-day-tour-7570571/>



Admiral Gilday with Vice Admiral Ajendra Bahadur Singh, Flag Officer Commanding-in-Chief, Eastern Naval Command.

India, France hold dialogue on maritime cooperation to bolster strategic ties

The Indo-French dialogue on marine cooperation helped enhance the strategic connection between France and India, stated the French embassy in India

By Anurag Roushan

On Monday, October 11, India and France convened the fifth session of the Indo-French maritime cooperation dialogue in Paris. Pankaj Saran, India's Deputy National Security Adviser, and M Marcel Escure, France's Ambassador for Regional Cooperation in the Indian Ocean Zone held in-depth discussions to bolster strategic partnership between the two countries.

The Indo-French dialogue on marine cooperation helped enhance the strategic connection between France and India, stated the French embassy in India. It was built on frequent and constructive discussions between Indian Prime Minister Narendra Modi and French President Emmanuel Macron, the embassy added. The fifth session provided an opportunity to build and strengthen Indo-French maritime security and safety cooperation projects, particularly through frequent exchanges and the expansion of fleets' connections, while underlining the Indo-Pacific region's common commitment, the statement read as reported by news agency ANI.



Image: ANI/AP

The Indian Ocean Rim Association (IORA), the Indian Ocean Commission (IOC), and the Indian Ocean Naval Symposium (IONS) are frameworks of regional forums that help improve Indo-French maritime cooperation. There has been tremendous development in India-France maritime security cooperation in recent years, with a focus on the Indian Ocean. With its expanding economic, marine military, and strategic goals in the Indo-Pacific region, India is eager to develop connections with countries throughout the area. Recognizing geopolitical trends, France has begun to emphasise its identity as an Indo-Pacific nation and willingness to enhance its partnerships with the region's major players, according to a report by the Indian Council of World Affairs (ICWA). Of late, the Indian Ocean has emerged as a hot topic in recent Indo-French bilateral talks, as both nations seek to broaden their long-standing strategic alliance to the marine domain, the report stated.

INS Tabar completes Indo-France partnership exercise

Meanwhile, earlier in the month of July, the Indo-French collaboration exercise was completed by the Indian Navy Ship, Tabar. Following INS Tabar's port visit to Brest, the maritime partnership exercise with the French naval frigate FNS Aquitaine had taken place in the Bay of Biscay. INS Tabar was paired with an NH 90 helicopter from FNS Aquitaine and four Rafale fighters from the French Navy for the collaboration exercise. Surface manoeuvres, replenishment at sea approach, firing on target, vertical replenishment, and cross-deck action were all carried out throughout the event, according to a statement by the Indian Navy.

<https://www.republicworld.com/world-news/europe/india-france-hold-dialogue-on-maritime-cooperation-to-bolster-strategic-ties.html>

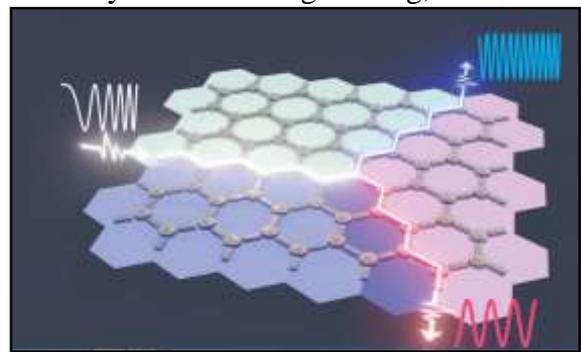


Thu, 14 Oct 2021

How to force photons to never bounce back

Topological insulators are materials whose structure forces photons and electrons to move only along the material's boundary and only in one direction. These particles experience little resistance and travel freely past obstacles such as impurities, fabrication defects, a change of signal's trajectory within a circuit, or objects placed intentionally in the particles' path. That's because these particles, instead of being reflected by the obstacle, go around it "like river-water flowing past a rock," says Prof. Romain Fleury, head of EPFL's Laboratory of Wave Engineering, within the School of Engineering.

Until now, these particles' exceptional resilience to obstacles applied only to limited perturbations in the material, meaning this property couldn't be exploited widely in photonics-based applications. However, that could soon change thanks to research being conducted by Prof. Fleury along with his Ph.D. student Zhe Zhang and Pierre Delplace from the ENS Lyon Physics Laboratory. Their study, appearing in the journal *Nature*, introduces a topological insulator in which the transmission of microwave photons can survive unprecedented levels of disorder.



Topological insulator as a multiplexer. Credit: Zhe Zhang / EPFL 2021

"We were able to create a rare topological phase that can be characterized as an anomalous topological insulator. This phase arises from the mathematical properties of unitary groups and gives the material unique—and unexpected—transmission properties," says Zhang.

This discovery holds great promise for new advances in science and technology. "When engineers design hyperfrequency circuits, they have to be very careful to make sure that waves are not reflected but rather guided along a given path and through a series of components. That's the first thing I teach my electrical engineering students," says Prof. Fleury. "This intrinsic constraint, known as impedance matching, limits our ability to manipulate wave signals. However, with our discovery, we can take a completely different approach, by using topology to build circuits and devices without having to worry about impedance matching—a factor that currently restricts the scope of modern technology."

Prof. Fleury's lab is now working on concrete applications for their new topological insulator. "These types of topological circuits could be extremely useful for developing next-generation communication systems," he says. "Such systems require circuits that are highly reliable and easily reconfigurable." His research group is also looking at how the discovery could be used for developing new kinds of photonic processors and quantum computers.

More information: Romain Fleury, Superior robustness of anomalous non-reciprocal topological edge states, *Nature* (2021). DOI: [10.1038/s41586-021-03868-7](https://doi.org/10.1038/s41586-021-03868-7). www.nature.com/articles/s41586-021-03868-7

Journal information: *Nature*
<https://phys.org/news/2021-10-photons.html>

Study demonstrates the potential of a quantum computer comprised of a small processor and a storage unit

By Ingrid Fadelli

Quantum computing systems, computer systems that are based on the key principles of quantum theory, could significantly outperform conventional computing systems, both in terms of speed and performance. Over the past decade or so, many physicists worldwide have thus been trying to develop these systems and assess their potential.

Instead of encoding information in bits, units of information with binary values (i.e., either 1 or 0), quantum computers use quantum bits or qubits. Qubits are quantum mechanical analogs of bits that can exist in more than one state (i.e., 1 and 0 simultaneously).

Most quantum computing systems developed so far consist in a series of qubits placed on a 2D chip, which directly compute information. Classical computers, on the other hand, are made up of a processor, which processes information, and a memory, which stores information.

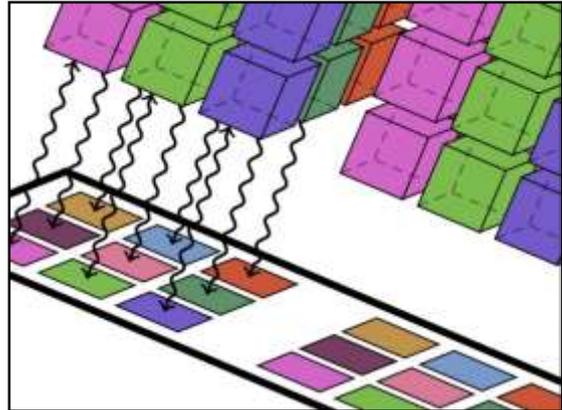


Figure showing the quantum computer architecture proposed by the researchers. Credit: Gouzien & Sangouard.

Researchers at Université Paris–Saclay, CNRS, CEA, have recently carried out a study evaluating the performance of a quantum computer with a structure that resembles that of conventional computers. Their results, published in *Physical Review Letters*, suggest that incorporating quantum information storage units into quantum computing systems could enable the creation of devices that contain significantly fewer qubits in their processors.

"The architecture usually considered for quantum computers consists in laying all the qubits on a 2D chip and running the computation directly on those qubits," Élie Gouzien, one of the researchers who carried out the study, told Phys.org. "In our work, we wanted to challenge this idea of having all the qubits on a single processor and investigated another architecture, closer to the one of a classical computer, where a small processor is coupled with a memory."

To effectively compare their architecture with existing quantum computing systems, Gouzien and his colleagues decided to evaluate their ability to run a given algorithm. More specifically, they evaluated the resources that their architecture needed to run this algorithm, including the error correction overhead.

"We detailed the decomposition of the algorithm into elementary gates, adapting it to fit the architecture under investigation," Gouzien said. "We also took into account the overhead of the error correction. We then put those two parts together to evaluate the physical resources required to run the factorisation algorithm."

The researchers showed that using a processor made of 13,436 physical qubits combined with a memory that can store 28 million spatial modes and 45 temporal modes, a 2048-bit RSA integer could be factored over 177 days with 3D gauge color codes. They also suggest inserting additional error-correction steps of the stored qubits every second, which would only increase the run time by approximately 23%. The team found that they could also achieve shorter run times and storage times simply by increasing the number of qubits in the processing unit.

Overall, Gouzien and his colleagues found that the addition of a memory component could dramatically reduce the number of qubits inside a quantum computing system's processor. In their paper, the team suggests that their architecture could be realized by placing a microwave interface between a processor made of superconducting qubits and a multiplexed memory.

"Of course, designing an efficient quantum memory is not an easy task, but it is already a research domain, and it is a more distinct challenge than fitting millions of qubits into a cryostat," Gouzien said. "We hope that our article will stimulate research on quantum memories, and also orientate it toward their use for computation."

More information: Élie Gouzien et al, Factoring 2048-bit RSA Integers in 177 Days with 13 436 Qubits and a Multimode Memory, *Physical Review Letters* (2021). DOI: [10.1103/PhysRevLett.127.140503](https://doi.org/10.1103/PhysRevLett.127.140503)

Journal information: [Physical Review Letters](https://phys.org/news/2021-10-potential-quantum-comprised-small-processor.html)
<https://phys.org/news/2021-10-potential-quantum-comprised-small-processor.html>



Thu, 14 Oct 2021

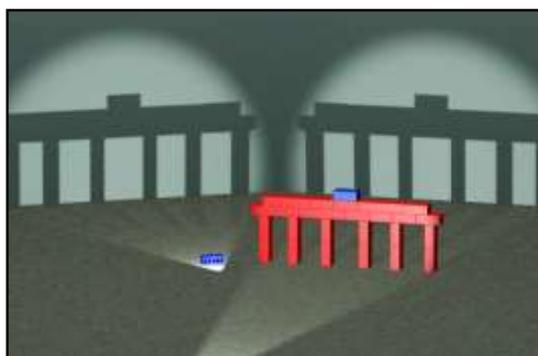
A highly simplified way to predict quantum light-matter interactions

By Jenny Witt

When light interacts with matter, for example, when a laser beam hits a two-dimensional material like graphene, it can substantially change the behavior of the material. Depending on the form of interaction between light and matter, some chemical reactions appear differently, substances turn magnetic or ferroelectric or begin to conduct electricity without any losses. In particularly thrilling cases, an actual light source may not even be necessary because the mere possibility for light to exist, i.e., its quantum equivalent, the photons, can change the behavior of matter. Theoretical scientists try to describe and predict these fascinating phenomena because they could be crucial in the development of new quantum technologies.

However, calculating quantum light-matter interactions not only eats up enormous amounts of time and computing power—it also becomes very cumbersome. Describing the strong interaction between a realistic material with photons easily consumes thousands of Euros. Now scientists from the Theory Department of the Max Planck Institute for the Structure and Dynamics of Matter (MPSD) in Hamburg have found a way to simplify some of these calculations. Their work, now published in *PNAS*, provides a significant step towards integrating the quantum nature of light into modern-day devices.

"Imagine you are given a set of construction bricks to build a model of the famous Berlin Gate," says Christian Schäfer, lead author of the study. "Intuitively, we start placing the stones on top of each other to resemble the shape of the gate, but with each stone, the construction becomes more unstable and expensive. Similarly, because we sometimes have to consider many hundreds of photons, our calculations can become overwhelmingly complex and the cost of our theoretical predictions spirals very quickly. In fact, this cost is so prohibitive that predicting the full interplay



Describing quantized light-matter interaction can be a cumbersome task that demands many building blocks to add up correctly, a bit like building the Berlin Gate from individual stones (right). Schaefer et al. found a new way to reshape the equations describing the matter so that they account for much of the quantum light, a bit like carving the Berlin Gate from an individual stone rather than building it block by block. Credit: Joerg Harms / MPSD

between many photons and realistic molecules is de facto impossible to compute, even on the fastest and biggest existing super-computers."

Now, the MPSD team, based at the Centre for Free-Electron Laser Science (CFEL) in Hamburg, has found a simple but brilliant way to circumvent this problem. By reshaping the equation so that the material part itself accounts for the quantum mechanical uncertainty of the light, far fewer additional photons are needed to describe the combined system of quantum light and matter.

"In effect, we built the Berlin Gate by carving it from the first stone to arrive at approximately the same result," explains Schäfer. "This allows us to describe the quantum interaction between light and matter with very little additional cost compared to just considering the material."

To take an example, when the interaction between light and matter becomes so strong that both systems become truly interlacing, each possible configuration of the light-field can demand the consideration of hundreds of photons. The new approach can capture most features of this extreme limit without the need to consider any photon at all. Adding just a few photons is then enough to provide the full picture.

The method yields considerable savings in computing time and provides a framework for scientists to predict the interplay between quantum light and matter for realistic systems in situations that were prohibitive to simulate. "Our approach can serve as a solid foundation for future developments, providing a path to integrate quantum light more strongly into chemistry, material design and quantum technology," Schäfer says. "Within the general formalism many novel effects might still await discovery," adds MPSD Theory director Angel Rubio. "The engineering of materials and molecular complexes through light is becoming a reality. We are embarking on a long and exciting journey to explore its full potential implications in novel quantum technologies and the team's work provides an important step along this path."

More information: Christian Schäfer et al, Making ab initio QED functional(s): Nonperturbative and photon-free effective frameworks for strong light–matter coupling, *Proceedings of the National Academy of Sciences* (2021). DOI: [10.1073/pnas.2110464118](https://doi.org/10.1073/pnas.2110464118)

Journal information: [Proceedings of the National Academy of Sciences](https://www.pnas.org/doi/10.1073/pnas.2110464118)
<https://phys.org/news/2021-10-highly-quantum-light-matter-interactions.html>

More than half of covid-19 patients suffer from long haul symptoms, study finds

By Marisa Dellatto

Topline

A study found that more than half of people who had Covid-19 experienced at least one long-haul symptom six months or more after their initial diagnosis, a rate that has the potential to “overwhelm existing health care capacity,” at a time when care systems are already bursting at the seams.

Key Facts

- Published Wednesday in the Journal of the American Medical Association, the statistical survey included results from 57 studies that encompassed over 250,000 people who had survived Covid-19 and found that 54% suffered at least one symptom one month after their diagnosis, 55% did between two and five months after, and 54% did at six months or more.
- The most common symptoms were wide ranging and included chest imaging abnormalities, difficulty concentrating, generalized anxiety disorder, functional impairments and fatigue or muscle weakness.
- Issues with the heart, digestive system, and ear, nose, and throat were also frequently reported.

Big Number

44,615,612. That’s how many coronavirus cases the United States has seen since the start of the pandemic as of press time, according to Johns Hopkins University.

Tangent

Being vaccinated may not have an effect on someone’s risk of developing long Covid. According to a New England Journal of Medicine study quoted in the JAMA survey, 19% of people who have been fully vaccinated still experienced symptoms six weeks after initial infection.

Key Background

Long-hauler syndrome can be one of the most debilitating effects for people who survive Covid-19 infection. The Centers for Disease Control and Prevention define long Covid as “a wide range of new, returning, or ongoing health problems people can experience four or more weeks after first being infected.” People who did not experience symptoms from their Covid-19 bout can still experience post-infection symptoms, according to the CDC. A study published by the group last month found that one-third of people were dealing with symptoms two months after being infected. The organization said that more research is needed to understand who gets these symptoms and why they last so long.

<https://www.forbes.com/sites/marisadellatto/2021/10/13/more-than-half-of-covid-19-patients-suffer-from-long-haul-symptoms-study-finds/?sh=28224b5c7f91>

